

THE FORESTER.

An Illustrated Journal Devoted to Forestry

Issued Six Times a Year.

Each Number Contains Sixteen Pages of Reading Matter.

FIFTY CENTS A YEAR, IN ADVANCE.

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OFFICIAL ORGAN OF THE

NEW JERSEY FORESTRY ASSOCIATION.

Published under the auspices of the Avalon Summer School of Forestry.

VOLUME I.

JULY 1, 1895.

No. 4.

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ORGANIZED MAY 12, 1894

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THE FORESTER IS SENT TO MEMBERS OF THE ASSOCIATION FREE

The object of this Association is to protect and improve the forests of the State; to encourage the planting of trees and to educate the coming generation in the principles of Forestry.

"The conductors of this enterprise are in earnest, and THE FORESTER is likely to train public opinion in the right direction."—*The Nation*.

"To assist in preserving and protecting the woodlands of the State is the praiseworthy purpose of the New Jersey Forester."—*Newark Evening News*.

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SINGLE COPIES, TEN CENTS.

Free to all members of the New Jersey Forestry Association.

Edited by JOHN GIFFORD, Mays Landing, N. J.

At the meeting of the New Jersey Forestry Association, in Trenton, on the 18th of last month, this journal was made the official organ of that Association. It will contain in full the proceedings of that organization and will be sent free of charge to every member. The membership fee is one dollar. Through the liberality of the friends of forestry we have been able to reduce the price of this journal to fifty cents a year. We appeal to all people who have any interest whatever in their state and country to aid this cause, which, to every thinking man, is a worthy one, by sending one dollar and his name. In order to wield sufficient influence to bring about several very practical changes in the treatment of our forests, especially to teach the coming generation the principles of Forestry, and to give woodlands the protection to which all property is entitled against careless and malicious individuals and other destructive agencies, looking forward to the time when it will

be profitable and possible to establish a conservative, economic policy for the forests on those parts of the State which are unfit for agriculture, the concerted action of a large number of influential people is necessary.

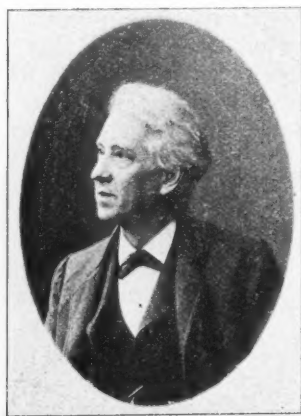
In order to introduce the subject in our public schools, the fountain head of all great reforms in this country, the Avalon Summer School of Forestry has been established. This institution is intended especially for teachers. It is located at Avalon, Seven-Mile-Beach, Cape May county, New Jersey. The destruction of forests by drifting sand is beautifully illustrated on this beach. There will be frequent excursions to the forests of the mainland. There is excellent opportunity for bathing, boating and fishing. The session begins the eighth of July, and lasts until the tenth of August. There are seven regular instructors connected with the school, all well known in their departments, besides other teachers. The work will be of a very practical nature. If successful this will be the first school of its kind in this country. The persons who are backing this institution are in earnest, and although not wealthy, donate their services and pay their own expenses. They hope for the co operation of the friends of forestry throughout this country.

The days of "log-rollings" are past. It is not necessary for a settler to call in his neighbors to help him burn the logs which impede his progress.

Leaders of Forest Reform.

III. PROF. A. C. APGAR.

Prof. Austin Craig Apgar was born at Peapack, Somerset County, New Jersey, in 1838. In 1861 he was graduated at the New Jersey State Normal School, and from 1866 to the present time has been a professor in that institution. He has done more than any other Jerseyman to arouse interest in trees among public



PROF. A. C. APGAR.

school teachers. He has written several books on zoological and botanical topics. His "Trees of the Northern United States," published by the American Book Company, is one of the most useful books of its kind ever written. It is concise and accurate, and contains descriptions of many introduced species.

DEPARTMENT OF AGRICULTURE,

WASHINGTON, D. C., May 14, 1895.

JOHN GIFFORD, Esq.,

May's Landing, N. J.

Dear Sir—In reply to your urgent invitation for me to participate in the expedition of the American Forestry Association under the auspices of the New Jersey Forestry Association, I regret to state that my official duties at present are such as to forbid my absence during this week. I must, therefore, neglect the duty which would devolve upon me as President of the American Forestry Association and at the same time forego the pleasure and profit which

such an inspection of the forest conditions of Southern New Jersey would give me.

I hope that this visit of our Association will be helpful in arousing the attention of the people of your State to the fact that they have unfortunately too long withheld a proper interest from one of their most important resources. If only a little care had been used in cutting the original timber and especially if the baneful fire had been kept out, the forests of New Jersey could have been maintained in continuous reproduction of wealth, while now many hundreds of square miles have been turned into absolute wastes, withdrawn from profitable use for many decades. The need for a more intelligent consideration of this subject is certainly urgent.

Your proposition to compile an "Arbor Day" book which shall set forth the value and assure a more intelligent application of this potent method of education interests me naturally very much. I fear myself that its object, namely, to create a proper appreciation of the need and important influence of tree growths on civilization is too often overlooked and its educational value thereby diminished.

Wishing you success in the present meeting and in your efforts to arouse your people to a realization of their own interests. I am

Very truly yours,

J. STERLING MORTON,
Secretary.

The growing of Christmas trees for market would be, if properly conducted, a legitimate and, no doubt, profitable business. Although the custom is time-honored and gives pleasure to children for a few days, it seems a shame to sacrifice thousands of beautiful young trees for such a useless purpose. There is hardly an old field in Southern New Jersey which does not show the work of Christmas tree thieves. They cut down the thriftiest cedars as soon as of a marketable size, and cut the tops out of full grown trees. All this is to celebrate a custom the meaning of which nobody exactly knows. The city of Paris uses 40,000 Christmas trees every year.

Governor Morton appointed Enoch C. Bell, Waldo G. Morse and J. J. R. Croes, Commissioners, to confer with representatives of the State of New Jersey with reference to the preservation of the Palisades.

The Palisades of the Hudson.

Among the traces of the great convulsions which disturbed the earth during its progress from chaos to its present condition, there are few so impressive and so grand as those which result from the bursting forth of imperfectly cooled masses of the primeval rocks which first solidified and formed the nucleus of this mundane spheroid, but from time to time seem to have become impatient of their confinement by the gradually cooling and condensing superjacent matter, and have broken through the crust which was forming over them, and solidifying there have created dykes and sheets of rock devoid of all traces of life.

The instances where eruptions of this kind have occurred of such extent and force as to protrude the partly cooled rock far above the general surface and in such a manner that the protruded mass has been since entirely denuded by

qualified for scientific study and intelligent enjoyment of the great works of nature.

Unfortunately, however, both trap rock and timber have a considerable market value for what are termed practical uses as distinguished from educational and æsthetic advantages, and the hand of the spoiler has been laid upon both the crest and the face of this mountain range.

In spots the cliffs have been denuded of their forest growth and summer residences erected, several of which have been destroyed by fire and left deserted. For many years occasional



NATURAL CLIFF ON THE PALISADES.

more wonderful is at our property and pride of New Jersey, but also the delight and glory of New York, and a wonder of the world, the Palisades of the Hudson River, from Hoboken to Haverstraw.

On this noble parapet of the Hudson there are, moreover, some of the finest examples of virgin forest left in this section of the country, and the combination of cliff, and woodland and extended water views render the district une-

quarries have been opened along the base of the wooded slope which lies between the vertical cliffs and the Hudson River and the trees stripped off and fragmentary excavations made, leaving bare and unsightly blemishes. Latterly these defacements have been undertaken systematically, and on such an extended scale as to arouse the indignation and apprehensions of those who believe that grand natural scenery is worthy of preservation and more particularly of residents of the opposite shore of the river, whose views are spoiled by the mutilation of

the cliffs and talus, and whose comfort and pleasure are destroyed by the constant reverberations and shocks caused by the frequent explosions of heavy blasts.

In response to a suggestion which met with hearty approval from the public press of both the States immediately concerned and also of others far removed, the Legislatures of both New Jersey and New York have taken official steps towards what seems to be a practical method of preventing further spoliation of the Palisades. The first action was taken by the Legislature of New Jersey in February last in

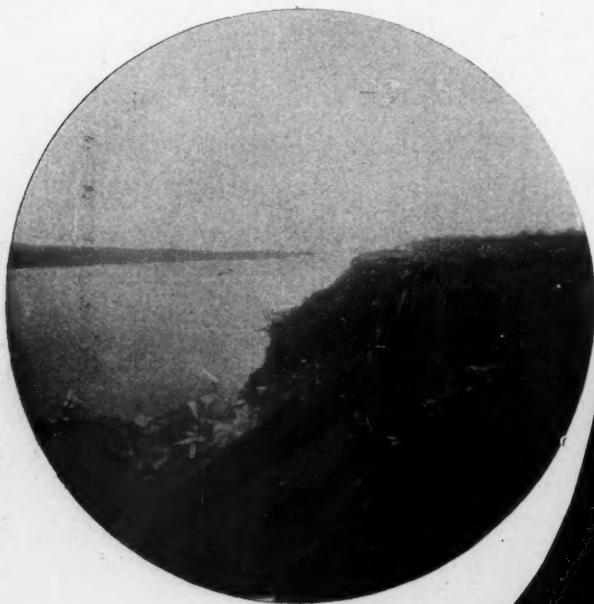
The attention of the Governor of New Jersey being called to this action, he promptly recommended a similar action on the part of the New Jersey Legislature, to which that body immediately responded.

Such a solution of the problem of the preservation of the Palisades would be in entire accordance with the policy of the National Government with reference to the rescuing from spoliation of regions of great scientific and historic interest, and also with the policy of individual States.

This is not a case in which a single State could act, but is purely an interstate matter to be regulated by the general government alone.

The people of New Jersey will watch with interest the progress of the work of this joint commission and we doubt not will hail with satisfaction a successful solution of the problem entrusted to them.

C.



THE MUTILATED CLIFF AT FORT LEE.

the passage of a law requiring the Riparian Commissioners of the State to insert in any grant of land along the Hudson river water front, a provision that the vertical face of the cliff should not be mutilated nor encroached upon. The New York Legislature followed with an enactment providing for the appointment of a joint commission of citizens of New York and New Jersey to devise a plan for submission to the United States authorities for the acquisition of the Palisades by the United States as a National Park and Reservation.



—Charles Parry.

Mr. Theodore A. Havemeyer, of New York City, intends to place his forest lands near Mahwah, N. J., under regular forest management. Mr. F. R. Meier has charge of the work.

The flowers of the linden furnish excellent honey.

Meeting of the American and New Jersey State Forestry Associations.

From Garden and Forest.

The idea of holding inipatetic forestry meetings, and combining instructive excursions with sessions for the discussion of topics with special relation to the regions traversed, was first carried out in August of last year, when the American Forestry Association met under the auspices of the New Hampshire Forestry Commission in the White Mountains. The success of that meeting, both from the social and forestal point of view, suggested a repetition this spring in southern New Jersey, where, with the formation of the South Jersey Woodmen's Association and the New Jersey State Forestry Associations, the movement for a rational treatment of the forest-cover of that State had just received its first impetus.

The meeting began with an evening session at Camden on May 15th, when Mr. B. E. Fernow delivered his richly illustrated lecture, "The Battle of the Forest," discussing the evolution of forest-growth, the forces of nature with which the forest has to contend in order to establish itself, and the methods and means employed in this warfare, the evil results of improper partisanship on the part of man, by which not only is the forest resource itself decimated and deteriorated, but soil and water conditions are injured sometimes beyond redemption. Numerous views from this continent and from abroad illustrated the points made.

The next morning found the party on the way to Cape May over the level, sandy, alluvial plains of southern New Jersey. The first observation of interest was, that on both sides of the railroad, about two rods away from the roadbed, there was roughly plowed a strip of land about a rod in width, a "safety strip" to protect the forest-growth against the spread of fire from the railroad. This precaution, which has been quite effectual, is a result of the intelligence of the adjoining property holders, who insisted on holding the railroad company responsible for damage in case of fire, and the company found it cheaper to prevent than to pay damages. Colonel Fox, Superintendent of the New York State Forests, who was of the party, stated that on the much-talked-of Webb Road in the Adirondacks, another system had been successfully pursued during last summer; a hand car with a crew and all necessary appliances to put out fires following each train.

If only the owners of forest land had a proper conception of the value of their property and of the great damage which these fires inflict—to the soil more than to the timber—they would soon be able to get rid of this one source of conflagrations.

The forest-growth of this part of New Jersey is, to be sure, mostly not of immediate economic value, the heavy timber of the original growth which once covered these alluvial sands having been entirely removed from most parts long ago; a second growth has taken its place, mainly of various Oaks, Yellow Pine, *Pinus rigida*, and occasionally Red Cedar and Holly, supplanted by White Cedar in the wetter portions, repeatedly injured by fires, yet bound to maintain itself, and sometimes in quite thrifty condition. With the fires kept out, by a judicious use of the axe, gradually culling out the inferior kinds and giving advantage to the better classes of timber, these abused areas would, without hardly any outlay, in twenty-five or thirty years become a valuable property. A basket factory, using Sweet Gum, and a sash, door and blind factory, using White Cedar, both situated along this line, give evidence that even now, at some distance from the road, virgin forest supplies are not entirely exhausted, while the thrifty surroundings of Vineland and of the Russian colony established by Baron De Hirsch show the capabilities of the soil under careful cultivation.

At Cape May the party enjoyed an afternoon stroll on the beach and an exchange of experiences and opinions regarding forestry problems. In the evening an attentive audience listened to an address by Mr. E. A. Bowers, Assistant Commissioner of the General Land Office, on the condition of the government forests and the duty of the Federal Government with regard to them. Mr. Bowers took the position that every citizen was a part owner, and hence interested financially in the great national timber domain situated on the western mountains, in a region which for its prosperity is dependent largely on irrigation, and hence on the storage of water supplies under the forest-cover.

Friday morning saw the party early on their way to Atlantic City. The forestry feature of interest en route was the sand dunes of Seven-mile Beach, below Avalon, which were visited by special train, kindly furnished by the Pennsylvania Railroad Company. The problem of the sand dunes could here be studied in all its phases. The forest-cover once removed from

the shore, the light sand is given over to the play of the winds, which drive it landward, and a wall of sand twenty to thirty feet in height is gradually moved, progressing from year to year more or less rapidly. A small strip of forest growth two hundred yards or so from the shore is now impeding its progress, and yet the dune is said to advance at the rate of one foot a year, covering this protective belt. The sand wall is some twenty-five feet high, with a slope of about forty feet on the leeward side encroaching on the timber, which consists of *Ilex opaca*, over one hundred and fifty years old, Red Cedar, with occasionally a Sassafras, an Oak or a Wild Cherry intermixed. The timber is only thirty-five feet high; the sharp sand particles driven by the wind cut off and shear like a hedge the tops of the trees, which are hardly ten feet above the highest level of the dune. It is interesting to note how long some of the submerged trees can retain their vitality, Cedars and Hollies, covered up to within ten feet of their tops, still showing life, while the Oaks and Sassafras are dead and crumbling, and the Cherries have shed their seed, giving rise to a new generation on the dune itself.

Where the forest has been removed the action of the wind reaches further inland, but where the forest barrier is intact the dune seems to have become quiet enough to allow a natural cover of Sand Grasses to establish itself, which may in time stop its further shifting. Since, however, the land belongs to a real-estate boom company, it is likely that the lots will be considered too valuable to keep the tree-growth intact, and its kindly offices unappreciated, it may have to go as elsewhere, with the assurance that the lots themselves, with houses and improvements, will gradually be drowned in the sand. Even the bathing beach, which is usually the only attraction, has in many places been spoiled, the sand being blown off and a muddy bottom remaining. The intimate relation of forest-cover to almost all other kind of business was here strikingly suggested, just as on the plains and in northern New Jersey the needs of the city of Philadelphia and other cities and towns for desirable supplies of drinking water would have suggested the close interests of their citizens to the forest conditions of those regions.

A beautifully illustrated lecture by Professor J. T. Rothrock formed the feature of the session at Atlantic City. The lecturer spoke of the habits, habitat and value of various forest trees

of Eastern States, and laid special stress on the fact that forest-growth was destined to be relegated to the agriculturally poor soils and situations.

Owing to rain it was decided to postpone the sessions at Lakewood to a more favorable season, when it might be possible to arrange for a continuation of the trip through the northern part of the State. Suitable resolutions of thanks were passed to those who had contributed toward the success of the meeting.

♦ ♦

"But I behold a fearful sight,
To which the white man's eyes are blind;
Before these hills were shorn and tilled,
Full to the brim our rivers flowed.
The melody of waters filled
The fresh and boundless wood,
And torrents dashed and rivulets played,
And fountains sported in the shade.
These grateful sounds are heard no more,
The springs are silent in the sun,
The rivers, by the blackened short,
With lessening currents run;
The realms our tribes are crushed to get
May be a barren desert yet."

—Bryant.

♦ ♦

The moisture conditions of pine soils are much influenced by the presence of many stumpholes. This is especially so in South Jersey, where, owing to forest fires, these holes are abundant. Dr. A. N. Bell, in *The Sanitarian* for May, 1893, calls attention to their value in this respect in the following words: "The taproot of the pine, penetrating from a few inches to a few feet in depth, according to the size of the sapling or tree at the time of its death, and its numerous radical branches as they decay, establish a natural system of soil drainage, which may be studied with profit by engineers and agriculturists."

♦ ♦

The newspapers are in debt to the forestry cause. They scold the lumberman, but to day wood pulp is the principal material used in the manufacture of all but the highest grades of book and writing paper. N. H. Egleston, of the Department of Agriculture, is authority for the statement that "Some of our great newspapers use from fifty to one hundred tons of pulp paper daily, and in one instance there were used two hundred tons for a single issue of one of these papers."

Proceedings of the Meeting of the New Jersey Forestry Association in Trenton, June 18th, 1895.

The New Jersey Forestry Association met at the State House, Trenton, on the 18th of June, 1895. The following representatives were present:

Franklin Dye, President, Trenton; Prof. J. C. Smock, Trenton, Capt. A. M. Bradshaw, Lakewood, Vice-Presidents; D. H. Wright, Riverton, Secretary; Henry I. Budd, Mt. Holly; Hon. Augustus W. Cutler, Morristown; Mrs. A. B. Pond, Plainfield; Mrs. L. N. Walton and Miss Helen Walton, Beverly, and John Gifford, May's Landing.

Minutes of the February meeting were read and adopted. After a few introductory remarks by Mr. Dye, Mr. Gifford spoke of the May meeting in connection with the American Forestry Association, a description of which, copied from *Garden and Forest*, is published in this issue. He referred, also, to the function of a State Forestry organization in the following words:

"The subject of forestry may be divided into arboriculture, sylviculture and forest influences. Arboriculture is to sylviculture what horticulture is to agriculture. Arboriculture belongs to landscape artists and nurserymen. It deals with trees from an æsthetic standpoint. It is only through sylviculture, the growing of wood for market, that we can win.

"For sylviculture to be profitable, it must be in a region where land is cheap and unfit for agriculture, near a good market, and with facilities for transportation. In Southern New Jersey we have reached the stage when the cultivation of white cedar will pay, but the difficulties in the way are the length of time that invested capital must wait for satisfactory returns and the unsafe condition of forests, owing to fires. It must be the work of the State Forestry Associations to overcome these difficulties by educating the people to think more of posterity and trees, and by influencing legislators to such an extent that they will provide protection, to a degree at least, against fires.

"We must increase our membership at once; add, in other words, to the list of pioneers on our books hundreds of names of influential people, so that we can demand at an early date what must come some day."

The Association decided to hold the next meeting in Lakewood, during the early part of

November. The following committee was appointed to arrange for that meeting: Mr. Gifford, Capt. A. M. Bradshaw and Mrs. L. N. Walton.

The following committee was appointed to revise the constitution and by-laws and to report at the Lakewood meeting; also to prepare a pamphlet explaining the purposes of the Association, to be distributed throughout the State prior to the meeting: Prof. Smock, Mr. Dye, Mr. Gifford and Miss Walton.

The FORESTER was made the official organ of the Association. The Association agreed to pay the editor one-half of all the annual dues after June 18th, to aid in its publication.

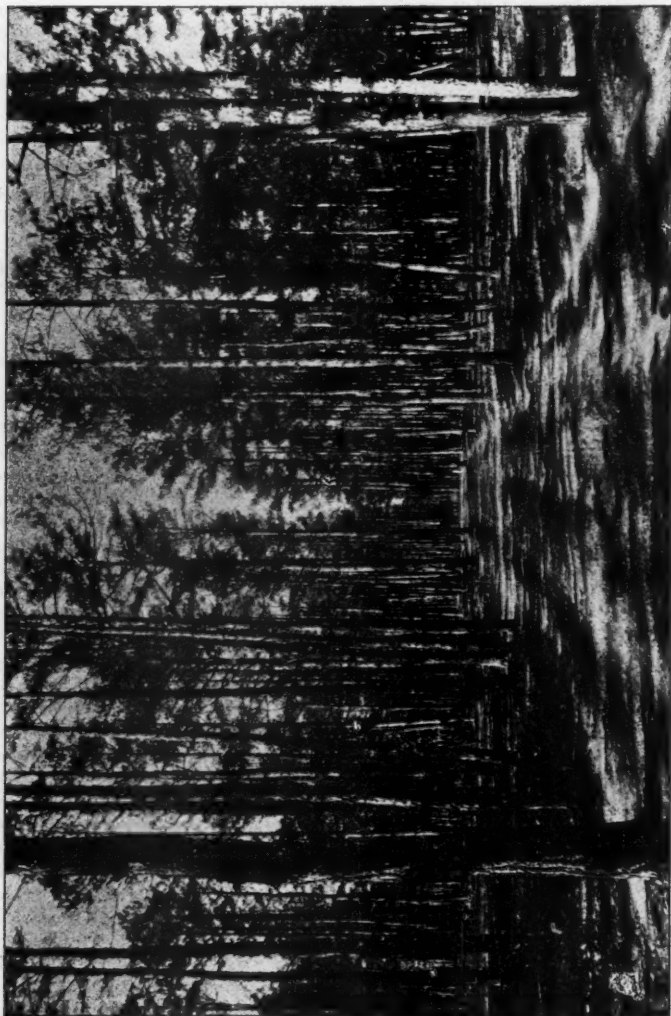
It was decided to make the Lakewood meeting the meeting for the election of officers for the ensuing year.

Prof. Smock, H. I. Budd and Mrs. A. B. S. Pond were appointed a committee to nominate officers for the next election.

Suitable resolutions were prepared by the Secretary, relating to the late Mr. Burrough, first President of the Association.

In referring to Dr. Rothrock's lecture in Atlantic City the *Daily Union* says: "It was a fairly good audience, however, in numbers and prime in its character, and for one hour and twenty minutes it followed its accomplished and pleasing leader through forest and field, mountain and valley, marsh and glen, stopping now under the outstretched arms of a mighty, rugged oak; looking up the tall, clean trunk of the beautiful hemlock; thinking of October days, brown leaves and browner hands while surveying the black walnut, the hickory, the chestnut; holding again the fishing-pole under the trailing limbs of the willow; climbing through rustic mountain canyons in search of useful trees growing on useless ground, and receiving introductions to novelties and trees that had been almost forgotten. It was a pleasant and instructive path that Dr. Rothrock led his audience. What he said as he went along was so beautifully woven into the beautiful pictures on the big canvas that the audience forgot time in the chase down a dusty road, the crossing of a mountain or the following of a stream; forgot the jaunt over a great State and a leap, now and then, into Maine and Virginia for comparison."

There have been few forest fires in South Jersey during May and June of this year.



PINE PARK, LAKEWOOD, N. J.

The region of Lakewood is one of the few places in New Jersey where large sums of money have been spent in guarding and improving the forest.

Edward Burrough.

In the May number of the FORESTER, a reference was made to the report of the State Road Commissioner, who was also President of the New Jersey Forestry Association, the Hon. Edward Burrough.

Soon after that article was written Mr. Burrough was called to the spirit world. Having been invited to address the survivors of the Twenty-third Regiment, N. J. Volunteers, at the residence of General E. Burd Grubb, on May 3d, he accepted as guest of General Grubb.

At the close of his address, which was delivered with much earnestness, he stated that he might not be present at the next reunion, and expressed the hope that he might meet them all beyond the river. After these words he shook hands with some friends standing near, and at the beginning of General Grubb's address he fell, dying instantly.

Mr. Burrough's life was a series of progressions from one degree of usefulness to another. He was a public spirited man and took an active interest in such matters as were contributive to public improvement, regardless; often, of the question of pecuniary gain to himself; hence much that he did was a real sacrifice. Naturally, with such a spirit, he was called to fill many responsible positions, local and general, in all of which he was most efficient and faithful. His home was the farm which he owned, near Merchantville, and which has been in the family for five generations—he being the fifth. His early education was secured at the Friends' Academy, Haddonfield, N. J., and the Tremont Seminary, Norristown, Pa. On July 15th, 1864, he formed one of the company of Minute Men which left Camden for the defense of Baltimore, under the command of Captain R. H. Lee, and was in several engagements, and at the conclusion of the rebellion was honorably discharged.

Without going into other details of his useful life in this article, it must suffice to say he was elected to the House of Assembly in 1879 and in 1880, and also held the position of County Clerk of Camden county. Both these positions he filled with marked ability. But the work by which he was best known and in which he took the greatest interest was in connection with the State Board of Agriculture, with which he has been identified for the past twenty years. Nine years ago he was elected President of the Board, which office he ably filled until he resigned at a meeting of the Executive Committee, held at

his home in September, 1894. He found the step necessary when he was appointed by Governor Werts to the position of State Road Commissioner.

Mr. Burrough's earnestness and public spirit were shown most prominently in his work in connection with New Jersey's agricultural and horticultural exhibit at the Columbian Exposition. The State World's Fair Commission having asked the State Board of Agriculture and Horticulture for exhibits, Mr. Burrough was appointed by the Executive Committee to collect, set up and maintain the exhibit. This was an arduous undertaking, but it was Mr. Burrough's great desire to place New Jersey agriculture, as he often said, in the "front rank among her sister States."

His final report covering that work appears in the annual report of the State Board of Agriculture for 1894-5.

Mr. Burrough seldom complained of ill-health, although it was evident to those most intimately associated with him that his long-continued and exacting work in connection with the World's Fair had made serious inroads upon his health. In his death the Forestry Association has lost an efficient and enthusiastic member, and those who remain must increase their efforts so that the good work so well begun may be continued and increased.

"I fully indorse the recommendations of the Secretary that adequate protection be provided for our forest reserves, and that a comprehensive forestry system be inaugurated. Such keepers and superintendents as are necessary to protect the forests already reserved should be provided. I am of the opinion that there should be an abandonment of the policy sanctioned by present laws under which the Government for a very small consideration is rapidly losing title to immense tracts of land covered with timber, which should be properly reserved as permanent sources of timber supply."—*Grover Cleveland.*

It is an interesting fact that in regions near Oklahoma where prairie fires have been checked by the Arkansas, Wichita and Red Rivers and their tributaries and the Wichita Mountains in the interior, there are abundant forests in a flourishing condition.

Subscribe for THE FORESTER.

Are Forest Fires a Necessary Evil?

From Garden and Forest.

The early outbreak this year of the natural phenomenon of the summers on the American continent, the forest fires, with New Jersey, Minnesota and Pennsylvania in the lead, suggests the inquiry whether nature could not be induced to change her ways. The nature of man, to be sure, is meant, for that is responsible for the phenomenon.

That this change is possible and that proper measures of prevention or organization may reduce the amount of danger to forest-growth from fire to a minimum is evident from the official figures of the forest-fire record in the Government forests of Prussia for 1893-4, which have just been published. The cisatlantic reader of the report will receive a good impression of the efficiency of the measures against forest fires when he reads the introductory statement "that the very dry weather during the months of March, April and May was responsible for a large number of forest fires, some of them extensive," and afterward finds enumerated sixteen cases only of sufficient extent to be mentioned, the smallest having covered about 20 acres, the largest not over 220 acres. Altogether, not more than 800 acres of forests were involved, half of this being woods from twenty to forty years old.

Since the Prussian Government forests comprise 6,000,000 acres, what is characterized as a "large number of forest fires, some of them extensive," means a little over one-hundredth of one per cent. of the forest area; and we must not overlook the fact that more than half of this forest is coniferous growth, mostly pine, and, therefore, especially liable to fire. The cause in most cases is noted as neglect. Locomotives are not mentioned, showing that rail-roading may be carried on without the necessity of extra risks. During the ten years, 1882-1891, there had occurred in these forests 156 larger conflagrations—96 from negligence, 53 from ill-will, 3 from lightning, and only 4 from locomotives. Seven years out of ten are without any record of fire due to the last cause.

This record, which to us at least would appear like perfection, is due, of course, in the first place to the fact that these forests are under a well-organized management, which insures the constant patrolling of the same by officers in pursuit of their business. Regulations as to the treatment of fires are, therefore, readily en-

forced, and any incipient fire is soon discovered and put out. Besides this, the method of dividing the forest into blocks or compartments by intersecting avenues, rectangular or otherwise, at regular distances, permits a small force to readily prevent the progress of fires and confine them within the block.

Where railroads run through forest lands, especially in the extensive pineries of the Baltic plain, additional precautions are practiced. Of course, spark arresters are in common use, but the main reliance is laid on a "safety-strip" running along the railroad, and more or less elaborate. Often this is only a clearing, frequently cultivated by the guards as a potato patch or for a field crop. The ideal and most effective treatment is illustrated by a cut showing a railroad embankment, which is, of course, kept clean of inflammable matter by timely burning; then a cleared space about seven yards in width; next a strip of forest fifteen to eighteen yards wide, in which the ground is kept as clean as practicable and free from dry wood, and which acts as a screen for flying cinders; beyond this is a ditch ten to twelve inches deep and five to six feet wide, the dirt of which is thrown to one side, making a ridge which may be planted with broad-leaved trees. About every twenty rods a cross ditch is made, so that the whole combination-strip, which is about thirty yards wide, is divided into smaller fields, within which it is easy even for one man to confine an incipient fire.

In this country we would hardly need to go to so much expense, but we might considerably reduce with small outlay much of the loss from locomotive fires. The Pennsylvania Railroad Company in New Jersey, from Camden to Cape May, in preference to paying damages to the forest owner, has plowed or scarified on either side of its road a strip about a rod wide, and this is tolerably effective. A ditch within thirty yards from the right of way in the woods, and a timely burning over in spring of this space, would be more effective, and I think any adjoining forest owner would gladly permit such protective measure to be taken by the railroad company on his land, and, indeed, could afford to contribute to the expense.

This cause of our forest fires, then, is largely avoidable; and so would be the fires due to other carelessness, if we should once set out in earnest to punish the offender. The trouble with our laws, even when they are backed by

public sentiment, is mainly that the machinery to execute them is absent or too weak. Minnesota, frightened into action by the sad experiences of last year, this winter enacted a fire law, with a commissioner to execute it, and as the appointee is General C. C. Andrews, long known as an earnest forest reformer, good will, at least, is promised in its enforcement.

Wisconsin, which has suffered almost as badly as her neighbor, has also enacted a law, approved on April 17th, in which the chief clerk of the State Land Office is made the forest warden, with the assistant chief clerk as his deputy. In both cases an organization of existing town officers as fire wardens is attempted, but whether these officers will be able to do their various duties without neglecting the last one imposed remains to be seen, especially as the provisions for expenses are extremely scanty. These laws, as well as the one so satisfactorily inaugurated in Maine, are modeled more or less closely after the forest-fire law of New York, which it was my privilege to draft in 1885, for the late Senator Low, who incorporated it in the general legislation for the Adirondack forests inaugurated that year. From the fact that it has been followed by others, it may be judged that the principles underlying it conform to the spirit of our institutions and to our conditions, but it will probably take a few more years of terrible loss of life and property before the practical application will have become natural and necessary to our people, and be extended to all states.

Not all forest fires are avoidable, but most of them can be prevented; at least they need not be allowed to spread beyond control, provided the people will it.

B. E. FERNOW.

Washington, D. C.

"To despise or to degrade the splendid things about us, is to prove ourselves unworthy of them. The Palisades of the Hudson can be made a sign board or a stone quarry, but the people who would suffer such desecration of them, would sink as low in the scale of man as they would fall in the esteem of the world. This world is something more than a workshop, and a sin against the sanctity of any created thing is a sin against our own souls."—*The Evangelist*.

The wood of the magnolia (*glauca*) is known by the local name of *brewster*.

Effects of Deforestation.

From the Philadelphia Evening Telegraph.

It seems well-nigh impossible to awaken the people of this country to the danger that threatens our prosperity through our continual indifference to the forestry question. Even in this State, which only a few years ago was among the first of the Union as a lumber producer, the question excites little general interest now, although the determined efforts of a small band of devotees to the cause have finally succeeded in securing the appointment of a Forestry Commissioner. Dr. Rothrock's recent report made known the fact of the practical worthlessness of a large tract of tree-clad land in the central counties of the State, but contained the cheering assurance that this district could be made to produce valuable timber at a comparatively trifling cost if it were only cared for properly. There was a slight agitation over the report at the time it was published, but this has already subsided, and despite the continued efforts of the Forestry Association, little has been done towards bringing about better times for the abused forests of this State. Gloomy as the no distant future seems for the lumber and agricultural interests of this State if fire and vandalism are allowed to have their way with our trees, the report of the United States Geological Survey for the Southern States just submitted at Washington, presents a far more appalling picture. In Northeastern Mississippi, Eastern Tennessee and Eastern Kentucky alone there are 10,000 square miles of upland farming country, according to the report, which only thirty years ago were under a high state of cultivation, but are now as desolate and barren as the Bad Lands of Dakota. This land, very productive under slave-labor, was abandoned during the war, and, denuded of all vegetable covering, had been gradually converted into a desert by the action of the elements. The rain, little by little, wore channels into the heavy loam, and these, deepened by every storm, facilitated the work of destruction until the soil was entirely stripped off the slopes. This distressing result of the abandonment of Southern farms is even more deplorable when it is realized how profitably the land could have been utilized for the production of timber. If timber trees—white pines for instance—had been planted on these farms twenty years ago, they would already have been rapidly approaching a marketable state. This, too, would have

been most beneficial to the farmers and planters remaining in the section, as it would have equalized the rainfall and have prevented the floods that have added to their misfortunes. Realize 10,000 square miles of country denuded of soil, save in the creek and river bottoms, and then realize that the agents that wrought this havoc have already begun work in sections of the mountain land of this State, and the necessity for the immediate enactment of laws governing the treatment of timber lands at once becomes apparent. The Government can only suggest the wholesale planting of swift-growing bushes and trees to check the further desolation of this district in the South; but here in Pennsylvania matters have not yet approached this pass, and our mountains can again be covered with timber trees, and our agriculturists relieved of the evils consequent upon irregular rainfall, if the people at large are aroused to the necessity of decisive legislation in the matter.

"The place to teach forestry is at the agricultural college in each State. We have little faith in a special forestry school maintained by the federal government at large expense. The whole people must be gradually educated to a knowledge of the principles of forestry and to common sense methods of applying these principles. Even in common and district schools the subject might receive attention in the form of a lecture at least once a year from a traveling expert, to be provided by the State Board of Education, State Agricultural College or Board of Agriculture. To attempt to give regular instruction on forestry in our common schools is useless, for the list of studies is already burdensome. Such a system of lectures, once or twice a year, could be given at small expense, and when properly reviewed by the teacher, our rising generation would learn some practical facts about forestry that they would never forget. Prof. Sargent's idea of employing the army in forestry conservation is a good one for the public domain in the West, but the forests in our older States will not be properly cared for except at the behest of our State Legislatures and with the aid of the people at large."—*American Agriculturist*.

Dr. T. M. Lightfoot found several very beautiful specimens of *Arethusa bulbosa* in bloom in the region of the "Plains" in Ocean County on the 7th of June.

Preserve the Watersheds.

From the Newark Advertiser.

The Legislature should no longer delay in taking steps to secure to the State the possession of the watersheds in New Jersey. This should have been done years ago, before private enterprise could buy up water rights in the Passaic Valley, and pre-empt whole regions which can only be recovered now by the exercise of the right of eminent domain. Legislatures have been culpably careless in a matter of supreme importance to the people of New Jersey, and the consequences are so plain now that any further procrastination will amount to betrayal of the State's vital interests.

When Newark, after ten or twelve years of idle discussion, finally decided to abandon the Belleville intake and go to the head waters of the Passaic for a new supply, it was found that capitalists had anticipated the city and had secured what we needed. It was also learned that these speculators had used for their purpose reports of engineers whom Newark had employed at a large expense to examine the watershed. That was a rare piece of municipal stupidity which is represented by at least three millions of the price Newark pays to the East Jersey Water Company for the Pequannock supply. And yet Newark has been more fortunate than Jersey City, which, with greater stupidity, rejected every proposition for co-operation in bringing water from the Passaic highlands, and finally has the alternative of drinking sewage water from Belleville or surrendering to a cormorant water corporation.

Newark is therefore secure for some years to come with its minimum supply of 50,000,000 gallons daily, but the consumption is steadily increasing, and will in time reach the limit of supply. What then will there be in reserve for us? And what will there be for other growing communities? If the Legislature supinely refuses to act, all the available watersheds of the State will be in the possession of private capital, and it will then be no more practicable for the State to condemn and take these rights than to condemn and take railroad property. We will have water barons measuring out and taking tribute for every gallon of water the people drink, just as we now have coal barons regulating the output of the mines and fixing the price at tide-water, or oil and sugar and other manipulators levying tribute on the necessities of the people.

With such impunity have our invaluable watersheds been appropriated that capitalists of New York and Philadelphia have been emboldened to project schemes for impounding New Jersey water in New Jersey soil, and transporting it to those cities for sale. It is evident, then, that the question of preserving to the people of New Jersey the water sources of the State is not a political one; it is not for partisans to take up or oppose. It is a question of patriotism and self-preservation for all. The neglect of the rights of the State, the protection and conservation of which should be the zealous duty of a Legislature, is chargeable to all Legislatures in the past. They have been equally culpable. It is time now for a new dispensation. The danger and the necessity are apparent to the dullest comprehension, and they have been emphasized by the most earnest warnings and admonition. Let the next Legislature act. Let there be no more delay and no more tampering with a solemn public duty.

"To bring about all these various things which are to help in the solution of our forestry problems, it is most needful to enlighten the public as to the true meaning of the problem, to make such propaganda among all classes of our people, and especially among those who own forest property, as will secure an expression of the popular intelligence and will. This is done by associated effort of those who understand the need and importance of action, and it must be done with reference to local conditions in each section of country. Hence the first, most important and most promising step towards the solution of our forestry problems is the formation and active exertion of State Forestry Associations, whose function it must be to shape and bring to execution a State forest policy."—*B. E. Fernow.*

"The private ownership of forests may be divided into three classes: The farmers who own wood-lots connected with their farms, probably now not 30 per cent. being so owned; the speculators, among whom may be included all those who hold forest property temporarily for the purpose of selling it to obtain the unearned increment from the third class, namely, those who develop and utilize the forest resources—lumbermen and manufacturers, into whose hands, finally, the bulk of the forest area must fall, and to whom we, therefore, must look for a forest policy."—*B. Fernow.*

There are reasons for believing that before many years every acre of soil within fifty miles of Philadelphia and New York will be carefully utilized. Hundreds of trolley lines are luring city people into the country. The population of Southern New Jersey is increasing rapidly and many acres of land have been cleared recently by Italians and other foreigners for the cultivation of berries. The time is coming also when the water in the streams of Southern New Jersey will be precious for irrigation. Although it has not been conclusively proved, there are many indications that irrigation in Southern New Jersey is practical. Cranberry growing is at present one of the leading industries of that region. In order to cultivate this fruit successfully, an enormous amount of water is necessary. An ideal bog must be located in such a way that it can be completely flooded or drained in a few minutes. The quantity of cranberries picked in Southern New Jersey increases rapidly from year to year. There are still thousands of acres available for that purpose. In the variety of its resources, New Jersey is a wonderful State. Although near large population centres, a large part of it is still in an undeveloped condition. When the country becomes densely populated, a more conservative treatment of our resources will be necessary. The competition which comes with it will sharpen the wits of the people, and, with toil, even our sandy barrens may become fruitful. Besides these, there are thousands of acres of rich, alluvial land which the plough has never touched. The principal evils of the region referred to are forest fires and land swindlers. Legislators have neglected South Jersey. Laws relating to forests, forest fires, watersheds, fish, game, oysters, clams, taxation on woodland and land speculating need to be revised.

The subject of stains, fillers, intensifiers and polishes for wood is an interesting and important one, since in that way many woods at present of little value may be profitably utilized. In future issues of this journal this subject will receive considerable attention. A firm in Camden manufactures a wood-finish which is claimed to possess peculiar properties. This liquid, which is almost colorless, combines chemically, it is claimed, with compounds in the wood to produce a beautiful and lasting coloring which varies with the grain and the kind of wood.

The German Forest.

From an Article in the Chautauquan, by Sidney Whitman.

"Throughout the early centuries of our era, the forest was the nurturing ground of the Germans, whither they sought refuge from defeat, and into which neither the Romans nor the barbarous horsemen from the east of Europe cared to follow them. They were born and bred in their forests, which offered them shelter in the long winters; and whence they issued forth in the spring, ready for fray and adventure. In the Middle Ages their convents were mostly situated adjacent to forests, in the depths of which the robber knights used to lie in wait for the monks on their home with the fat offerings of the faithful. And not for these alone. The forest offered a general place of ambush for all those of predatory instincts in times when then the right of the strong (*das faustrecht*) was exercised more or less all over the country.

"When we bear in mind the part the forest has played in German life through many centuries, it is not surprising that everything connected with *acu Wald* has gained a hold over the imagination of the people, the like of which we seek for in vain among Latin people, who have lived almost without forests for countless generations. Thus, to-day, where the Frenchman retires for rest or recreation to his *campagne*, to his riverside, or to his fashionable *bain de mer*, the German seeks change of scene among the many so called 'watering places,' which are generally in reality nothing else but picturesque forest sites, '*Luft-Kurorte*,' as the word indicates, places in which the pure forest air is supposed to bring 'cure, to the ailing. It is at times amusing to witness the almost fatalistic belief the nerve-racked German possesses in the 'curing' qualities of the forest. Week after week, he will spend the whole day from early morn till sunset in the woods of the *Luft-Kurorte*, eagerly inhaling the ozone-charged forest air and philosophically reflecting on the transitory character of all mundane matter.

"German characteristic of Bismarck that he resides at Friedrichsruh, in the midst of an old Saxon forest—the *Sachenwald*. There throughout the year his many admirers give each other *rendezvous* to do honor to Germany's greatest latter-day champion.

"In truth when I review the manifold expressions of veneration for Bismarck which the last few years have called forth, I cannot but think that some small portion of the patriotic senti-

ment his personality calls forth is owing to the fact that he lives in the forest. It would seem almost unnatural for the German mind to wax poetical over a man who lived in a town house, or, perhaps, in a luxurious flat like a Parisian *bourgeois*.

"We are also not surprised to find the forest playing a large part in the literature and song of Germany. To begin with, the old German gods are supposed to have in the *Götterhain*—the grove—the wood of the gods. The Nibelungen saga deals largely in forest scenery. In fact, Richard Wagner has gone so far as to devote an entire scene to the rendering of the song of birds in a German forest. But not only Wagner has felt strongly the spell of the woods. Most German song writers have given expression to their love of the glen. Thus Franz Schubert's beautiful series of *Mullertieder*, although nominally devoted to the illustration of miller life—are in reality forest songs. For in most parts of Germany the windmill is unknown, the mill is mostly driven by water—the water of a rapid running mountain stream—and thus the majority of German mills are situated in the forest. In the description of the sentiment connected with every phase of forest life, German writers and composers are almost as prolific as those of other countries in the theme of love.

"To me the most perfect expression of German sentiment in honor of the forest is to be found in the beautiful song of Mendelssohn's, entitled: '*Abschied von Walde*,' the words of which were written by Freiherr von Eichendorff, and the first verse of which runs as follows:

"Wer hat dich, du schöner Wald
Aufgebaut so hoch da droben?
Woht den Meister will ich loben,
So lang 'noch mein Stimm' erschallt!
Lebe wohl,
Lebe wohl, du schöner Wald!

"Nor do I think I can do better than close with an excellent translation of the above, by my gifted friend, Arthur Waugh, M. A., Oxon., the well-known biographer of Lord Tennyson:

"Who hath reared thee, forest fair,
High upon the mountain land?
Let me praise the Master hand,
While my voice hath strength to date.
Fare thee well,
Fare thee well, my forest fair."

The Plains of Jersey, as far as the eye can see, are white and pink with masses of laurel bloom (*Kalmia latifolia*).

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